Claims

1. A network hub structure for connecting network elements of a first WDM network supporting a first bit rate WDM data stream to other network elements on a second optical network supporting a second bit rate data stream which is substantially a multiple *n* of the first bit rate; the hub structure comprising:

- a multiplexing system comprising a plurality of multiplexing units, each multiplexing unit being arranged to multiplex *n* first WDM data streams into one second data stream, and

- a switching unit arranged, in use, to selectively cross connect any *n* first WDM data streams originating from one or more of the network elements of the WDM network destined for any same one of said other network elements to one of the multiplexing units for multiplexing into one said second data stream.

2. A network hub structure as claimed in claim 1, wherein the first bit rate WDM data streams are 1 Gbit/s Gigabit Ethernet data streams, and the second bit rate data streams are 2.488 Gbit/s SONET/SDH (OC48) data streams.

3. A network hub structure as claimed in claim 1, wherein each multiplexing unit is arranged to de-multiplex an incoming second data stream from the second network into *n* outgoing first WDM data streams destined for network elements on the first WDM network, and the switching unit is arranged to cross connect said outgoing first WDM data streams to a WDM unit if the network hub structure for multiplexing the outgoing first WDM data streams onto the first WDM network.

4. A network hub structure as claimed in claim 3, wherein each multiplexing unit comprises a tagging unit for tagging each first WDM data stream, and for allocating a wavelength to each outgoing first WDM data stream based on tags on the incoming second data stream.

5. A network hub structure as claimed in claim 1, wherein each multiplexing unit is incorporated in a Line Interface Card interfacing to a core hub on the second network.

6. A network hub structure as claimed in claim 5, wherein the network hub structure further comprises a plurality of Trunk Interface Cards disposed before the switching unit for interfacing to the first WDM network.

7. A network hub structure as claimed in claim 1, wherein the network hub structure further comprises a redundant switching unit for fault protection, the redundant switching unit being arranged, in case of a fault in the primary switching unit, to selectively cross connect the any *n* first WDM data streams originating from one or more of the network elements of the WDM network destined for the any same one of said other network elements to the one of the multiplexing units for multiplexing into one said second data stream.

8. A network hub structure as claimed in claim 1, wherein the second network is a second WDM network.

9. A network hub structure as claimed in claim 1, wherein each multiplexing unit comprises a 2xGbE/OC48 Packet Over SONET (POS) multiplexer unit.

10. A network hub structure as claimed in claim 1, wherein each multiplexing unit may comprise a SONET time division multiplexing (TDM) multiplexer unit.

11. A network hub structure as claimed in claim 10, wherein the SONET TDM multiplexer units are arranged, in use, to first decode 1.25 Gbit/s 8b/10b encoded GbE streams to produce two 1 Gbit/s streams, and to then multiplex the two 1 Gbit/s streams into SONET Virtual Containers.

12. A network hub structure as claimed in claim 10, wherein the SONET TDM multiplexer units are arranged, in use, to first decode the 1.25 Gbit/s 8b/10b encoded GbE streams to produce two 1 Gbit/s streams, and to then multiplex the two 1 Gbit/s streams into a SONET frame in alternate time slots.

13. A network hub structure as claimed in claim 12, wherein the SONET TDM multiplexer units are arranged in a manner such that, in use, additional filler bytes are being inserted to match to the capacity of the SONET frame.

14. A network hub structure as claimed in claim 10, wherein the SONET TDM multiplexer units are further arranged in a manner such that, in use, the decoded GbE streams are being re-encoded utilising a 5b/6b line code to produce 1.2 Gbit/s streams, before employing the multiplexing into the 2.488 Gbit/s OC 48 data streams.

15. A method for connecting network elements of a first WDM network supporting a first bit rate WDM data stream to other network elements on a second optical network supporting a second bit rate data stream which is substantially a multiple *n* of the first bit rate;

the method comprising the step of selectively multiplexing any *n* first WDM data streams originating from one or more of the network elements of the WDM network destined for any same one of said other network elements into one said second data stream.

16. A method as claimed in claim 15, wherein the first bit rate WDM data streams are 1 Gbit/s Gigabit Ethernet data streams, and the second bit rate data streams are 2.488 Gbit/s SONET/SDH (OC48) data streams.

17. A method as claimed in claim 15, wherein the method further comprises the step of de-multiplexing an incoming second data stream from the second network into *n* outgoing first WDM data streams destined for one or more network elements on the first WDM network and multiplexing the outgoing first WDM data streams onto the first WDM network.

18. A method as claimed in claim 17, wherein the method comprises the steps of tagging each first WDM data stream, and allocating a wavelength to each outgoing first WDM data stream based on tags on the incoming second data streams.